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Pressure-Shear Plate Impact experiments at pressures beyond 20 GPa[1] CHRISTIAN KETTENBEIL, MICHAEL MELLO, California Institute of Technology, TONG JIAO, RODNEY CLIFTON, Brown University, GURUSWAMI RAVICHANDRAN, California Institute of Technology, DIVISION OF ENGINEERING AND APPLIED SCIENCE, CALIFORNIA INSTITUTE OF TECHNOLOGY TEAM, SCHOOL OF ENGINEERING, BROWN UNIVERSITY TEAM — Recent modifications of a powder gun facility at Caltech have enabled pressure-shear plate impact experiments (PSPI) in a regime of pressures and strain rates that were not accessible previously. Heterodyne fiber optic interferometers are adapted to simultaneously monitor normal and transverse particle velocity histories using a 400 line/mm diffraction grating deposited onto the polished rear surface of the target plate. A PDV measurement system interferes the 0^{th} order beam to probe the normal particle velocity, while a transverse PDV (TPDV) arrangement employs the 1^{st} order diffracted beams to extract the transverse velocity. Results are interpreted using a strength model developed through symmetric PSPI experiments beyond the Hugoniot elastic limit of the target plates. These developments have been driven by the desire to characterize material strength at pressures exceeding 20 GPa. We present initial findings of our work on the pressure-shear response of silica glass at nominal strain rates in the range of 10^6 - $10^7 s^{-1}$.

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